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PLANKTONIC BIOLUMINESCENCE MEASUREMENTS IN ARCTIC
WATERS (U) NAVAL OCEAN SYSTEMS CENTER SAN DIEGO CA
D LAPOTA FEB 88

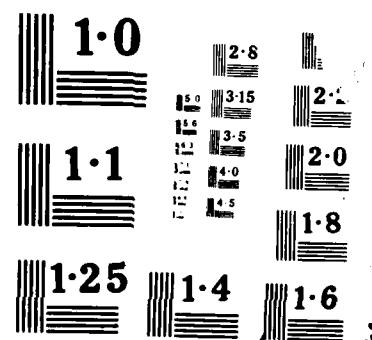
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AD-A191 765

DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED		1b. RESTRICTIVE MARKINGS													
2a. SECURITY CLASSIFICATION AUTHORITY SELECTED		3. DISTRIBUTION/AVAILABILITY OF REPORT													
2b. DECLASSIFICATION/DOWNGRADING SOURCE DATE S MAR 1 1988		Approved for public release; distribution is unlimited.													
4. PERFORMING ORGANIZATION NUMBER(S) CAB D		5. MONITORING ORGANIZATION REPORT NUMBER(S)													
6a. NAME OF PERFORMING ORGANIZATION Naval Ocean Systems Center		6b. OFFICE SYMBOL (if applicable) NOSC													
6c. ADDRESS (City, State and ZIP Code) San Diego, California 92152-5000		7a. NAME OF MONITORING ORGANIZATION Naval Ocean Systems Center													
8a. NAME OF FUNDING/SPONSORING ORGANIZATION Office of Naval Research		8b. OFFICE SYMBOL (if applicable) ONR													
8c. ADDRESS (City, State and ZIP Code) 800 N. Quincy Street Arlington, VA 22217-5000		9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER													
11. TITLE (include Security Classification) Planktonic Bioluminescence Measurements in Arctic Waters		10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. 61153N PROJECT NO. ME69 TASK NO. RR0310201 AGENCY ACCESSION NO. DN388 504													
12. PERSONAL AUTHOR(S) D. Lapota		13b. TIME COVERED FROM Jan 1988 TO Jan 1988													
13a. TYPE OF REPORT Presentation speech		14. DATE OF REPORT (Year, Month, Day) February 1988													
15. PAGE COUNT		/													
16. SUPPLEMENTARY NOTATION															
17. COSATI CODES		18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number) bathyphotometer bioluminescence copepod													
<table border="1"> <tr><td>FIELD</td><td>GROUP</td><td>SUB-GROUP</td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </table>		FIELD	GROUP	SUB-GROUP											
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19. ABSTRACT (Continue on reverse if necessary and identify by block number) Bioluminescence has been observed infrequently in arctic waters although recent measurements at high latitudes, even under pack ice, indicate that measured intensities are comparable to open ocean and coastal intensities. Bioluminescence measurements were conducted in the summer months of 1986 above the Arctic Circle in open water in Vestfjord, Norway and in pack ice in the Beaufort Sea, north-east of Pt. Barrow. Stations in the ice were kept open by the icebreaker USCGC <i>Polar Star</i> (WAGB 10) as the submersible bathyphotometer was deployed by the ship's hydrographic winch with a steel cable to approximately 100 meters below the sea surface. Vertical bioluminescence intensity profiles were recorded and the associated planktonic species were collected either from the effluent of the bathyphotometer or from the net tows to identify the major sources of the measured bioluminescence.															
Among the Vestfjord stations, maximum bioluminescence intensity was always found within 15-30 meters below the sea surface while intensity was markedly less below 50 meters. The maximum bioluminescence intensity from all profiles ranged from $3 \times 10^8 - 2 \times 10^9$ photons $\text{sec}^{-1} \text{cc}^{-1}$ of seawater while the bioluminescence intensity at a depth of 90-100 meters ranged from $3 \times 10^6 - 4 \times 10^7$ photons $\text{sec}^{-1} \text{cc}^{-1}$ of seawater.															
In the Beaufort Sea, distinct layers were observed within the upper 50 meters, but the measured intensity was approximately 3×10^6 photons $\text{sec}^{-1} \text{cc}^{-1}$ of seawater. In the MIZ, the maximum intensity was approximately 2×10^8 photons $\text{sec}^{-1} \text{cc}^{-1}$ of seawater 15 meters below the sea surface. Biological collections were tested on board in a laboratory plankton test chamber which identified the copepod <i>Metridia longa</i> , their nauplii, and <i>Protoperidinium</i> dinoflagellates as a few of the significant bioluminescent species.															
Presented at American Geophysical Union, Ocean Sciences Meeting, 18-22 January 1988, New Orleans, LA.															
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT <input type="checkbox"/> UNCLASSIFIED/UNLIMITED <input checked="" type="checkbox"/> SAME AS RPT <input type="checkbox"/> DTIC USERS		21. ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED													
22a. NAME OF RESPONSIBLE INDIVIDUAL D. Lapota		22b. TELEPHONE (include Area Code) (619) 553-2810	22c. OFFICE SYMBOL Code 524												



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